

**CALIFORNIA ENERGY COMMISSION**1516 NINTH STREET  
SACRAMENTO, CA 95814-5112**DOCKET****97-AFC-1C**DATE SEP 28 2011RECD. SEP 28 2011

**DATE:** September 28, 2011  
**TO:** Interested Parties  
**FROM:** Felicia Miller, Compliance Project Manager

**SUBJECT: High Desert Power Project (97-AFC-1C)  
 Staff Analysis of Proposed Modifications to Extend Date of Recycled Water Feasibility Study**

On May 10, 2010, High Desert Power Project, LLC filed a petition with the California Energy Commission to amend the Energy Commission Decision for the High Desert Power Project. Staff prepared an analysis of this proposed change and a copy is enclosed for your information and review.

The High Desert Power Project is an 830 MW combined cycle power plant located in the City of Victorville in San Bernardino County. The project was certified by the Energy Commission on May 3, 2000, and commenced commercial operation in April 2003.

The proposed modifications will allow High Desert Power Project, LLC to extend the due date of the recycled water feasibility study from December 31, 2011 to September 30, 2013.

Energy Commission staff reviewed the petition and assessed the impacts of this proposal on environmental quality, public health and safety, and proposes revisions to existing conditions of certification for **SOIL & WATER-1 f**. It is staff's opinion that, with the implementation of revised conditions, the project will remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications will not result in a significant adverse direct or cumulative impact to the environment (Title 20, California Code of Regulations, Section 1769).

The amendment petition and staff's analysis has been posted on the Energy Commission's webpage at [www.energy.ca.gov/sitingcases](http://www.energy.ca.gov/sitingcases). The Energy Commission's Order (if approved) will also be posted on the webpage. Energy Commission staff intends to recommend approval of the petition at the November 2, 2011 Business Meeting of the Energy Commission. If you have comments on this proposed modification, please submit them to me at the address below prior to October 29, 2011.

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Comments may be submitted by fax to (916) 654-3882, or by e-mail to [fmiller@energy.state.ca.us](mailto:fmiller@energy.state.ca.us). If you have any questions, please contact me at (916) 654-4640. For further information on how to participate in this proceeding, please contact the Energy Commission Public Adviser's Office, at (916) 654-4489, or toll free in California at (800) 822-6228, or by e-mail to [publicadviser@energy.state.ca.us](mailto:publicadviser@energy.state.ca.us). News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail to [mediaoffice@energy.state.ca.us](mailto:mediaoffice@energy.state.ca.us).

Enclosure







**HIGH DESERT POWER PROJECT (97-AFC-1C)**  
**Petition to Change Submittal Date for Reclaimed Water Use Feasibility Study**  
**Soil and Water Resources Analysis**  
**Abdel-Karim Abulaban and Paul Marshall**  
**September 2011**

## **INTRODUCTION**

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On May 10, 2011, High Desert Power Project, LLC (project owner) filed a Petition to Amend to extend the recycled water feasibility study submittal due date to December 31, 2013 (HDPP 2011a). The change being requested by the project owner is to extend the due date of the recycled water feasibility study from December 31, 2011 set in Condition of Certification **SOIL&WATER-1** to December 31, 2013. This would allow the project owner an extension of 24 months from the original due date.

The proposed amendment addresses delays that were beyond the project owner's control due to conditions that occurred after the approval of the previous amendment, adopted November 18, 2009, which permitted the High Desert Power Project (project or HDPP) to use recycled water (CEC 2009). These delays resulted in the project owner's inability to use up to 1/3 recycled water, and to meet the deadline of December 31, 2011 to file the feasibility study of the project using up to 100 percent recycled water for project evaporative cooling and industrial uses.

The petition to amend has been evaluated in accordance with the California Environmental Quality Act (CEQA) and current laws, ordinances, regulations, and standards (LORS).

## **LAWS, ORDINANCES, REGULATIONS, AND STANDARDS COMPLIANCE**

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The same LORS for the original analysis and the subsequent amendment of 2009 are still applicable.

## **PROJECT DESCRIPTION AND BACKGROUND**

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The High Desert Power Plant is an 830 megawatt natural gas-fired combined-cycle power plant located in the City of Victorville (City) in San Bernardino County. The project uses the bulk of its industrial water in evaporative wet cooling towers. The project includes a zero liquid discharge (ZLD) system to treat and recover some water from waste disposal streams.

The HDPP has been operational since April 2003, and its primary water supply is surface water purchased from the City through a contract with the Mojave Water Agency (MWA). The MWA is a Long-Term State Water Project (SWP) Contractor with a full entitlement of 75,800 acre-feet (AF) of SWP water (CEC 2006 and DWR 2007, Table B-4). Based on its design, the HDPP has the potential to consume up to 4,000

acre-feet per year (AFY) of raw water from the SWP. The historic annual consumption of SWP water has been approximately 3,000 AF, based on recent project operations.

Drought and pumping constraints that federal biological opinions have placed on the SWP have resulted in fluctuations in deliveries to MWA. From 2001 to 2005, deliveries of SWP water to MWA averaged less than 10,000 AFY (DWR 2007, Table B-5B). MWA expects SWP deliveries to continue to fluctuate for the next ten to fifteen years due to requests for additional water by other SWP contractors and insufficient yield from SWP conservation reservoirs (MWA 2005, Chapter 4). Due to the primary water supply being non-steady, the project owner has been required to maintain a groundwater bank where contract water from the City above HDPP operational needs is injected into the underlying aquifer (groundwater bank) for retrieval for HDPP when SWP water is unavailable. Additionally, the project owner petitioned for, and was granted, modifications to their permit to allow the use of up to 1/3 recycled water and construction of a recycled water pipeline. However, a condition of the amended decision required the project owner to submit by December 31, 2011 a feasibility study for converting the project to 100 percent recycled water (CEC 2009).

Based on the amounts of water the project has used in the past two years, if the project owner had to rely on the not yet fully developed recycled water or on its current banked groundwater supply, it might only be able to operate HDPP for approximately 12 months. If the project owner continues to rely on SWP as the sole source of water it will be at risk of having to significantly limit HDPP operation or shut down plant operation within the next two years.

## **PROPOSED AMENDMENTS**

Per the May 10, 2011 Petition to Amend, the project owner seeks to extend to December 31, 2013 the deadline for completing a feasibility study (specified in Condition of Certification **SOIL&WATER-1.f.** and its **Verification**) of increasing the use of recycled water for project evaporative cooling and industrial uses up to 100 percent.

## **ANALYSIS**

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The project owner and the City of Victorville have provided information that shows there have been a series of events related to the delivery of the recycled water from the City that have been out the project owner's control. These events have in turn impacted the project owner's schedule to complete the required feasibility study.

When the Petition to Amend to allow HDPP to use up to 1/3 recycled water was approved in November 2009, the project owner was in negotiations with the City for a contract for recycled water. Had a contract been signed soon after the decision to approve the amendment and recycled water deliveries had begun, the project would have had about 20 months through December 31, 2011 to study the use of up to 100 percent recycled water and submit a final feasibility study to the Energy Commission, as required in the adopted amendment. The recycled water contract with the City was not signed until September 2010.

The project owner stated that the City's intention has been to supply recycled water from its Industrial Wastewater Treatment Plant (IWWTP) as the preferred source of recycled water. After the contract between the City and HDPP was signed the City did not have the necessary facilities to deliver the recycled water to HDPP in place until early 2011. When the City was ready to deliver the recycled water from the IWWTP to the project, the City determined that the water did not meet the specifications set forth in the purchase agreement. The City then offered to supply recycled water from the Victor Valley Wastewater Reclamation Authority's (VWVRA) domestic wastewater treatment plant on or around January of 2011. As of the date of this amendment, the City did not provide information about a definite date when the recycled water from the IWWTP will meet the specifications for delivery to the power plant.

In order for the City to supply the VWVRA recycled water to the HDPP, they had to construct a short pipe connecting the recycled water line from VWVRA to a one million gallon reservoir that was constructed so that the City can deliver recycled water to HDPP. Construction of the pipeline was completed in March 2011. However, the power plant was not operating due to low demand for power, and thus was not able to start using recycled water for on-site testing. Once the power plant was back online in July of 2011, it started to receive the VWVRA recycled water on July 20. Supply of recycled water started at a rate of 500 AFY (about 440,000 gallons per day), but has been intermittent due to various reasons. According to Jon Boyer, the plant operator, they plan to increase the rate by a certain fraction of the plant's average annual demand over a number of steps until the exploratory rate of approximately 1,000 AFY has been reached (verbal communication with Jon Boyer, August 23, 2011). Performance data will be collected at each step. As of September 19, 2011, they are up to a rate of about 600 AFY.

Staff acknowledges that the events described above were largely out of control of the project owner and had a significant impact on their ability to comply with **SOIL&WATER-1.f**. Staff also understands that because HDPP was not originally designed to use recycled water for cooling and process water, the project owner needs time to test the existing facilities to determine how they will respond to the introduction of recycled water. This study is needed to develop designs to expand existing on-site water treatment facilities and add new facilities as needed. Also, the fact that there are two streams of recycled water available to the project, which are of different characteristics, adds to the complexity of the feasibility study.

Staff also acknowledges that the use of recycled water can pose additional challenges when a zero liquid discharge (ZLD) system is used. However, staff notes that there are existing power plants currently using recycled water successfully, some with operational ZLD systems similar to those at HDPP. Staff believes that there is a significant base of information and equipment manufacturer experience with recycled water ZLD treatment systems that the project owner could utilize and complete a portion of the feasibility study while the testing phases are under way. The owner is encouraged to take advantage of this information to ensure timely completion of the feasibility study.

Staff requested the project owner to submit a scope of the feasibility study to justify the requested extension of time. Staff learned from information exchanged with the project

owner both verbally and through email that the project owner is planning to use an incremental approach to test existing equipment (HDPP 2011b). The process has started by introducing recycled water at a relatively low rate, which will be gradually increased to observe how the existing facilities perform. Since the recycled water currently used is from the VVWRA stream, which is from treated domestic waste water, the test results will generally be applicable to recycled water from this source only. Staff encourages the project owner to consider the characteristics of the recycled water from the other stream, produced by IWWTP, when developing test protocols or designing for any new facilities or modification of existing ones. This will help the project owner prepare the plant to handle the types and range of recycled water streams, if and when the IWWTP stream becomes available.

Staff concurs that the feasibility study may need to span a period that includes two summer seasons and at least one winter season, consistent with what was proposed in the previous amendment for the recycled water conversion. This will ensure that the testing covers variable conditions in terms of water demand and characteristics of the recycled water stream, which can vary from one season to the next. This is especially true when the project uses the recycled water from the IWWTP which treats wastewater from the Snapple drink processing plant where the characteristics of its waste water vary with the seasons.

The owner has requested the due date of the study be extended to December 31, 2013, which is approximately 29 months from the date the HDPP started to receive and use recycled water. Staff is recommending that the applicant be permitted to test the response of existing facilities to the use of recycled water for a period of approximately 24 months from the date the project started to receive recycled water, and an additional two months to prepare designs for modifying existing facilities and acquiring additional equipment, if deemed necessary. Since the HDPP started to receive and use the recycled water from VVWRA on July 20, 2011, staff therefore recommends that the date of the feasibility study be extended to September 30, 2013.

The ability of the project to use recycled water for up to 1/3, and to study the use of up to 100 percent, of its cooling and industrial water will affect the project water supply reliability in several ways. First, it will directly decrease water demand from the SWP and the MWA. Second, it will free up more SWP water to be banked, improving that as a backup water supply. And lastly, initial uses of recycled water will allow the project owner to test the feasibility of converting the project to 100 percent recycled water. If proven feasible, the conversion to 100 percent reclaimed water will provide even more water reliability benefits to the project and further lessen water demand on the SWP. The proposed amendment to extend the due date of the feasibility study does not have any significant impacts and could improve water supply reliability for the project.

## **LORS ANALYSIS**

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No LORS will be affected by the proposed modification.



## PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION

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Staff generally concurs with the owner that the deadline for the feasibility study should be extended. However, the date suggested by the owner results in a period for testing that is much longer than the 24 months the owner stated would be needed. Therefore, staff recommends that the deadline be changed to give the owner approximately 24 months for testing, plus two months to document the results of the study. Since the project started using recycled water on July 20, 2011, staff recommends extending the feasibility study submittal deadline to September 30, 2013.

It should be reiterated here that the feasibility study should include all the items listed in the November 18, 2009 Order to amend the project to use recycled water. In addition to those items, the feasibility study should cover the conditions expected from the use of recycled water from the VVWRA as well as the City's IWWTP as it is the preferred recycled water source and may be needed in combination with the VVWRA source to provide up to 4,000 AFY needed by the project.

**SOIL&WATER-1** Water used for project operation (except for domestic purposes) shall be State Water Project (SWP) water obtained by the project owner consistent with the provisions of the Mojave Water Agency's (MWA) Ordinance 9 and/or appropriately treated recycled waste water.

- f. The project owner shall continue with the feasibility study evaluating the use of 100 percent reclaimed water for evaporative cooling purposes and other industrial uses. The feasibility study shall be completed by the project owner and submitted to the CPM. ~~no later than December 31, 2014.~~

### **Verification:**

The project owner shall provide a biannual report on the progress being made on the feasibility study for use of 100 percent recycled water for power plant cooling and other industrial uses. The report shall include information related to project modifications that may be needed for using up to 100 percent recycled water. The first report shall be due six months after the adoption of this condition, **and the final feasibility report shall be submitted to the CPM no later than September 30, 2013.**

The **final** feasibility study ~~to be submitted by December 31, 2011,~~ should contain, but not be limited to, the following information: ...

## CONCLUSIONS

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Staff has determined that the date to submit the feasibility study may be extended to give the project owner sufficient time to test the response of its facilities to the use of the current supply of recycled water, and have provided a revised Condition of Certification **SOIL&WATER-1.f.** and **Verification** to reflect the new due date. The project owner indicated that they need to conduct tests under variable conditions in terms of quantity and quality of recycled water, which vary with season. The owner further indicated that testing should cover two summer seasons and at least one winter season. Therefore,

staff recommends extending the due date of the feasibility study to provide the project owner approximately 24 months for testing, plus two months to document the results of the study. Since the project started receiving and using recycled water on July 20, 2011, the recommended date for the submittal of the results of the recycled water feasibility study would be September 30, 2013.

The ability of the project to use recycled water for up to 1/3, and to study the use of up to 100 percent, of its cooling and industrial water will affect the project water supply reliability in several ways. First, it will directly decrease water demand from the SWP and the MWA. Second, it will free up more SWP water to be banked, improving that as a backup water supply. And lastly, initial uses of recycled water will allow the project owner to test the feasibility of converting the project to 100 percent recycled water. If proven feasible, the conversion to 100 percent reclaimed water will provide even more water reliability benefits to the project and further lessen water demand on the SWP. The proposed amendment to extend the due date of the feasibility study does not have any significant impacts and could improve water supply reliability for the project.

Since the amendment is for extending the due date of the feasibility study for recycled water use and not for changing the nature or source of the water from that approved by the November 2009 amendment, no LORS have been affected, and therefore the project will still be compliant with all LORS applicable for both the original Decision and the amendment of 2009.

## REFERENCES

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- CDFG 2003 -- California Department of Fish and Game. Memorandum of Understanding by and between the California Department of Fish and Game and the Victor Valley Wastewater Reclamation Authority regarding the Discharge to the Mojave River Transition Zone, dated 6/27/03.
- CEC 1999 -- California Energy Commission. Staff Assessment of the High Desert Power Project, dated 1/21/99.
- CEC 2006 -- California Energy Commission. Staff Analysis of Petition to Amend Condition of Certification Soil & Water-4 Water Banking Schedule Project, dated 5/26/06.
- CEC 2009 -- California Energy Commission. Staff Analysis of Petition to Amend Condition of Certification Soil & Water-1: Prohibition of use of Recycled Wastewater, and Soil & Water-4: Water Banking, dated 4/20/09.
- DWR 2007 -- California Department of Water Resources. Bulletin 132-06, *Management of the California State Water Project*, published 12/07.
- HDPP 2008 -- High Desert Power Project, LLC. Petition for Modification to Use Reclaimed Water, dated 8/12/08. Submitted to CEC/Docket Unit on 8/14/08.
- HDPP 2009 -- High Desert Power Project, LLC. Response to Data Requests, dated 7/20/09.
- HDPP 2011a -- High Desert Power Plant, LLC. Petition to Amend to Extend the Recycled Water Feasibility Study Due Date to December 31, 2013. Filed and Docketed May 10, 2011.
- HDPP 2011b -- High Desert Power Plant, LLC. Responses via email dated 7/26/2011 to an email initiated by staff requesting information on a scope of the feasibility study.
- MWA 2005 - Mojave Water Agency, 2004 Regional Water Management Plan, February 24, 2005.